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Applicant : **MICROFIBRES, INC.**  
1 Moshassuck Street, P.O. Box 1208  
Pawtucket, Rhode Island 02862-1298 (US)

Inventor : **McCulloch, James R.**  
38 Cooke Street  
Providence , Rhode Island (US)

Representative : **Brown, Kenneth Richard et al**  
R.G.C. Jenkins & Co. 26 Caxton Street  
London SW1H 0RJ (GB)

**Pearlescent flocked fabric.**

A flocked fabric having colors with long wearing capabilities includes a textile substrate, raised fibers adhered to the substrate, and a pearlescent pigment colorant selected from the group consisting of gold, silver and other pearlescent metals adhering to the raised, erect fibers and arrayed on the fabric in a printed pattern.



FIGURE 1

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## Background of the Invention

The present invention relates to improvements in printing flocked fabrics with pearlescent or metallic print pastes. Velvets and flocked fabrics have a substrate with these fibers standing up from the substrate, which give the fabric a soft, luxurious, fluffy feel. The fibers also, however, cause problems when it comes to printing the fabric with a decorative pattern or other pattern. That is, since the top surface of the fabric has vertically extending fibers, it is difficult to print the fabric without having grin through of the substrate and other undesirable attributes.

It is known in some circumstances to apply a gold overlay while applying a discharge print paste, but such gold overlay constitutes a thin, not strongly adherent top layer of gold to the tips of the fibers. The gold is, accordingly, not very wear-resistant. Furthermore, the cost involved in the two-step discharge printing is considerable.

It is also known to print with a print paste which requires post-printing calendaring to embed the print into the nap. However, this can crush or otherwise damage the nap, significantly changing the hand and/or appearance of the fabric in undesirable ways.

Accordingly, there is a need in the art for a flocked fabric having improved color brightness and distinctness in its print, and an improved process for manufacturing such fabric on a cost-effective basis.

## Summary of the Invention

The invention fulfils the need in the art by providing a flocked fabric having colors with long wearing capabilities including a textile substrate, raised fibers adhered to the substrate, and a pearlescent pigment colorant adhering to the raised fibers. The fabric is a light lay or erect pile fabric which does not require an after calendaring process.

In the presently preferred embodiment the pearlescent pigment colorant is selected from the group consisting of gold, silver and other pearlescent metals. According to one aspect of the invention, the colorant is adhered to the fibers strongly enough to show no wear after 15,000 cycles on a Wyzenbeek abrasion test.

Preferably, the colorant is arrayed on the fabric in a printed pattern. The pattern may include areas colored with a pigment other than the pearlescent pigment colorant.

In various embodiments, the fibers may be pre-dyed a solid color.

The invention also provides a process of printing a flocked fabric to achieve a long wearing coloration of the fabric. The process includes making up a print paste of a pearlescent pigment colorant, applying the print paste to the flocked fabric and curing the print paste on the flocked fabric to adhere the pearlescent

pigment colorant to the fabric. In one embodiment the making up step includes mixing the colorant to achieve a viscosity of about 15,000 +/- 3000 centipoise.

Preferably, the print paste is applied with a rotary gravure screen printer. The printer may also apply pigments which color differently than the print paste.

Preferably, the process further includes curing a binder for the pigment after the applying step. This is typically done by exposing the fabric to a temperature of about 390 degrees Fahrenheit.

If desired, the making up step may include adding a dye to the print paste. Preferably, the applying step includes applying the print paste to the fabric in a screen printing operation, with the screens having holes at least as large as the holes in a 40 mesh screen (a mesh screen with 40 holes per square inch).

The printing may be carried out in what is known to the textile printing art as a thermographic process. The invention may include the preliminary steps of dyeing the fibers and adhering the dyed fibers to the substrate.

## Brief Description of the Drawings

Figure 1 is a photograph of a fabric printed in accordance with the invention.

## Detailed Description of the Preferred Embodiments

The improved process and product of the subject invention include the use of a commercially available print paste formulation which can strongly adhere pearlescent pigment colorant materials to the fibers of the fabric. Two preferred formulations are Eccobrite Gold GG 7891 and Eccobrite Silver Pearl NM 100-239, both of which are available from Eastern Color and Chemical Company, 35 Livingston Street, Providence, Rhode Island 02904. These formulations have been found to provide strong wear-resistant properties for the pearlescent pigment colorant on the flocked fabric. Other sources of such pearlescent pigments may be used. The listed pigment formulations available from the above-identified vendor bind the pigment particles with an acrylic binder, and include a mixture of mica (which provides a pearlescent lustre), titanium dioxide and colouring agents. For metallic pearlescent pigments, the colouring agents include metallic particles, such as gold or silver particles.

The viscosity of the print paste for use in a conventional rotary gravure screen printer should be about 20,000 centipoise. The viscosity may be increased by adding thickeners such as 957 paste available from Polymer Industries, Div. of Morton-Thiokol of Greenville, SC.

The print paste described above is used for one or more colors in a rotary gravure screen printing process. The invention may also be carried out with

flatbed printing. Suitable apparatus for carrying out the process is commonly available in the textile industry, such as equipment available from Johannes Zim-mer Maschin of Klagenfurt, Austria. Rotary Gravure screen printers are preferred, with the screens being provided with 40 mesh holes. In some instances 50-60 mesh holes may be preferred, depending on the pattern to be printed. The print paste is squeezed out of the holes by a rod located in the print screen. Preferably a rod 15 mm in diameter is used, but other rod sizes may be preferred for different hole sizes and patterns to be printed.

The fabric, having had a dye stuff applied in patterns according to the various stages of the printing apparatus, is then cured to fix the pigment on the flocked fabric. The print paste described above can be cured by exposure to dry heat at about 390 degrees Fahrenheit. The curing causes the pearlescent pigment to be securely bonded to the fibers of the flocked fabric.

The fabric made according to the present invention is very wear-resistant and suitable for use as upholstery fabric. The fabrics printed with the gold have been tested in a Wyzenbeek tester for up to 15,000 cycles with no wear being experienced. This qualifies the fabric as a "heavy duty" fabric.

The photograph making up Figure 1 of the drawings of this application illustrate an effect obtainable with the invention. The photograph illustrates a fabric made up of pre-dyed black fibres, adhered to a substrate. The fabric is printed with a wavy gold pattern, using a gold print paste as described above. This results in a bold looking fabric with the black background being highlighted with the brilliant gold surface. The gold is strongly adhered to the tips of the fibers, but is densely enough packed on the tips so that the effect is of an opaque gilding. The pile stands erect, not having been subjected to a calendaring process which could crush or deflect the pile fibers.

As can be appreciated, the invention provides numerous possibilities for effecting brilliant new pearlescent prints on flocked fabrics.

#### Claims

1. A flocked fabric having colors with long wearing capabilities comprising a textile substrate, raised fibers adhered to said substrate, and a pearlescent pigment colorant adhering to said raised fibers.
2. A fabric as claimed in claim 1 wherein said pearlescent pigment colorant is selected from the group consisting of pearlescent gold, pearlescent silver and other pearlescent metals.
3. A fabric as claimed in any preceding claim where-  
in said colorant is adhered to said fibers strongly enough to show no wear after 15,000 cycles on a Wyzenbeek abrasion test.
4. A fabric as claimed in any preceding claim where-  
in said colorant is arrayed on said fabric in a printed pattern.
5. A fabric as claimed in claim 4 wherein said pattern includes areas colored with a pigment other than the pearlescent pigment colorant.
6. A fabric as claimed in any preceding claim where-  
in said fibers have been pre-dyed a solid color.
7. A fabric as claimed in any preceding claim in which the raised fibers are erect.
8. A flocked fabric having colors with long wearing capabilities comprising a textile substrate,  
raised fibers adhered to said substrate,  
a pearlescent pigment colorant selected from the group consisting of pearlescent gold, pearlescent silver and other pearlescent metals adhering to said raised fibers and arrayed on said fabric in a printed pattern,  
a pigment other than said pearlescent pigment colorant arrayed on said fabric in other portions of said printed pattern,  
wherein said pearlescent pigment colorant is adhered to said fibers strongly enough to show only very little wear after 15,000 cycles on a Wyzenbeek abrasion test.
9. A process of printing a flocked fabric to achieve a long wearing coloration of the fabric comprising making up a print paste of a pearlescent pigment colorant, applying the print paste to the flocked fabric and curing the print paste on the flocked fabric to adhere the pearlescent pigment colorant to the fabric.
10. A process of printing as claimed in claim 9 where-  
in said making up step includes mixing the colorant to achieve a viscosity of about 15,000 +/- 3000 centipoise.
11. A process as claimed in claim 9 or claim 10 wherein said applying step includes applying the print paste with a rotary gravure screen printer.
12. A process as claimed in claim 11 wherein said applying step includes the step of applying pigments which color differently than the print paste.
13. A process as claimed in any of claims 10 to 12 further comprising curing a binder for the pigment after the applying step.

14. A process as claimed in claim 13 wherein said curing step includes exposing the fabric to a temperature of about 390 degrees Fahrenheit.
15. A process as claimed in any of claims 9 to 14 wherein said making up step includes adding a dye to the print paste. 5
16. A process as claimed in claim 9 wherein said applying step includes applying the print paste to the fabric in a rotary gravure screen printing operation, with the screens having holes at least as large as the holes in a 40 mesh screen. 10
17. A process as claimed in any of claims 9 to 16 wherein said making up, applying and curing steps comprise a thermographic process. 15
18. A process as claimed in any of claims 9 to 17 further comprising the preliminary steps of dyeing the fibers and adhering the dyed fibers to the substrate. 20
19. A process as claimed in any of claims 9 to 18 in which the printed fabric is not subjected to calendaring. 25
20. A process of printing a flocked fabric to achieve a long wearing coloration of the fabric comprising making up print paste of a pearlescent pigment colorant with a viscosity of about 15,000 +/- 300 centipoise, 30  
applying the print paste and other pigments which color differently than the print paste to the flocked fabric with a rotary screen printer with the screens having holes at least as large as the holes in a 40 mesh screen, and 35  
curing the print paste on the flocked fabric to adhere the pearlescent pigment colorant to the fabric by exposing the fabric to a temperature of about 390 degrees Fahrenheit. 40

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FIGURE 1



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# EUROPEAN SEARCH REPORT

Application Number

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
P,X	WO-A-9 220 524 (MICROFIBRES, INC.) * the whole document *	1,9,20	D06P5/00 D06Q1/06 D06P1/44
X	FR-A-1 525 629 (BAYER) * the whole document *	1,9,20	
X	DATABASE WPI Week 9031, Derwent Publications Ltd., London, GB; AN 90-234491 & JP-A-02 160 981 (HAGIWARA SANGYO K) * abstract *	1,9,20	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06P D06Q
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 SEPTEMBER 1993	Examiner DELZANT J-F.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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